



Air Force Research Laboratory|AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

ENGINEERS RAPIDLY PROTOTYPE AND DEVELOP AIRBORNE ENGINEER ALL-PURPOSE REMOTE TRANSPORT SYSTEM



The Airborne Engineer All-purpose Remote Transport System (AE-ARTS) is a low-cost, survivable platform that augments explosive ordnance disposal (EOD) so personnel can easily, safely, and effectively clear unexploded ordnances (UXOs) and other debris from training ranges, air fields, and threat areas. AE-ARTS provides users a robust suite of tools with which they can accomplish force protection and active range clearance activities.



Air Force Research Laboratory
Wright-Patterson AFB OH

Accomplishment

Working with Applied Research Associates, Inc., engineers from the Materials and Manufacturing Directorate modified the standard ARTS platform to support new requirements of the AE. The directorate rapidly prototyped, developed, and delivered the AE-ARTS to Headquarters Air Combat Command's Airborne Engineering Teams during Operation IRAQI FREEDOM for EOD, active range clearance, and debris-clearing activities.

Directorate engineers configured the AE-ARTS with new attachments including the Harley Box Rake and a remotely operated Enhanced Standoff Munitions Disruption system to dispose of small-UXOs. The directorate developed and adapted a new laptop Operator Control Unit (OCU) with situational awareness and Global Positioning System tracking/location capabilities for the system. Each AE-ARTS also comes with a remotely operated clamshell bucket for clearing larger debris and obstacles from aircraft and other operating surfaces.

Background

Engineers from the directorate's Air Expeditionary Forces Division developed the first-generation ARTS and shipped the unit to the Southwest Asia area of responsibility just after Operation DESERT STORM. The first-generation ARTS, a modified version of a standard light-construction tractor had Kevlar-reinforced rubber tracks with over 3,000 square inches of contact area, resulting in ground contact pressure of approximately two pounds per square inch.

The vehicle profile allows for a low center of gravity and light footprint, which makes the rugged and reliable vehicle the perfect candidate for clearance operations by minimizing forces that could disturb a UXO. The VERTEK robotic conversion enables remote operation of all tractor functions including engine start/stop, propulsion, lights, and tool operation.

The standard configuration includes fixed video cameras and digital radios, which transmit command signals from the OCU to the vehicle, and an independent transmitter/receiver pair communicates audio and video from the vehicle to the OCU. The standard ARTS operator control station includes the operator console with command-input device (joysticks and switches) and video monitor, control station data encoder and transmitter, data and video receivers and antennas, and video/audio recorder.

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-ML-43)

Materials and Manufacturing
Support to the Warfighter